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GENERAL NOTES.

GEOGRAPHY AND TRAVELS.¹

ASIA.—*Asiatic Notes*.—The peninsula of Kamtchatka is by the Russische Revue said to contain but 6500 people. There is no agriculture, and for food they rely mainly on the fish, chiefly salmon which throng the rivers in summer, and are dried and stored for the winter. On account of the scarcity and dearness of salt the fish often decompose, and the people suffer great privation. For clothes, utensils, tea, tobacco, they have to look abroad, and their imports, paid for in sable skins, are almost wholly from California. A chain of volcanic mountains, reaching 5000 feet in height, runs down the center of the peninsula, and through this the large navigable river Kamtchatka makes its way to the Pacific. —M. Leon de Rosny, the Japanese scholar, insists that the Aino is one of the two chief factors in the present Japanese race. He believes the Aino element to be a large one, and bases his arguments on an examination of the cosmogony, which contains two separate and distinctly marked mythologies, one of which is transparently aboriginal. Thus the Japanese of to-day is, in his opinion, a mixture of the conquering yellow and the conquered white races. —The celebrated French traveler, Charles Huber, who has, since 1879, been engaged in the exploration of the archæological remains of Central Arabia, was killed on July 30th, at Tafua by Bedouins of the tribe of Harb, while on his way from Hail to the Persian gulf. —Steers and Calmeyer islands, the product of the Krakatoa eruption, have again sunk, as has also an island a mile east of Verlaten island. —In 1868 a Russian surveying officer accidentally discovered in the Altai mountains the settlements of some Russian sectaries who had migrated thither during the last century. Recently the governor-general of Irkutsk, in a progress through his province, came upon a town called Ilim, with four churches and 150 houses. The town was governed by a *vetche* or public assembly, convoked by the ringing of a great bell, as at Novgorod the Great in its republican days. None of the inhabitants could read or write. The traveler Adrianen found settlements of sectaries, founded in 1800, at Tobut on Lake Koko-nor. These colonists had acquired savage and predatory habits. —M. A. Marche has explored the Calamienes archipelago south-west of Mindoro and north of Paluan. The three chief islands are Busuanga, Calamienes or Culion, and Linacapan. The natives of Culion are Tagbannas, an ancient people found also in Paluan, and probably spread formerly over a wider area. Some few are Christianized, but most are independent, and are fetich-worshippers. In the island of Dibatac, hills surround a horseshoe-shaped plain with a depression in the cen-

¹ This department is edited by W. N. LOCKINGTON, Philadelphia.

ter—perhaps volcanic.—A new map of Saghalin, prepared by M. Nikitine, shows that island to be considerably larger than was supposed. While M. Reclus gave the area as 63,600 square kilometers, M. Venukoff calculates that 73,529 is a nearer approximation. —It has been hitherto thought that the Gilbert islands were fast wearing away by the action of the sea during western gales. The belief was based upon the absence of the lee or western reef on some islands, and the anchorage afforded on the lee side of others, but a trader who has resided four years on Peru or Francis island states that when he came he could pass through the reef passage with a loaded boat at all states of the tide, whereas now the passage is dry at low water. From this and other indications it is believed that the island has risen two feet in the four years.

AFRICA.—*Results of the Journey of Mr. Jos. Thomson.*—West of Mombasa, on passing the Rabai hills, lies the undulating country of Duruma, densely covered with bush and tangle and thorny scrub. The miserable natives of this district are in perpetual dread of famine and of the spears of the Masai. At three days march from Mombasa an uninhabited country is reached, and by the fifth day a glaring sterile red sand marks the change from sandstone to schists and gneiss, thorns and gnarled trees replace the bush, and the land is flat. This waterless uninhabited wilderness extends from Usambara and Paré in the south to Ukambni and the Galla country in the north, and from Duruma in the east, to the volcano of Kilimanjaro westward; broken only by the mountains of Teita, arising like precipitous islands in a muddy sea to from three to seven thousand feet. On the western side of this desert, and somewhat eastward of the south side of Kilimanjaro, lies the district of Taveta, a bit of tropical forest on the banks of the snow-fed Lumi. The natives are a mixture of the Bantu tribe of Wa-Taveta with Masai who have been forced by the loss of their cattle to an agricultural life, and are a manly, pleasant, and honest, though immoral race. Kilimanjaro, the central mass of this region, has two summits, one the grand dome or crater of Kibo, towering above the forest-clad pediment of Chaga (where Mr. H. H. Johnstone is now residing with the chief Mandara) to a height above the sea about 18,880 feet; the other the pinnacle of Kimawenzi (16,250 feet) with its dark rocks and jagged outlines. The base of the mountain near Taveta is dotted with parasitic cones, and a few miles to the north of Taveta lies the small crater lake of Chala, in the center of a crater about two and a half miles across. The southern slopes of Kilimanjaro are (according to Mr. Jos. Thomson, from whose recital before the Royal Geographical Society these particulars are taken) carved into varied scenes of hill and dale by numerous streams, which rise high upon the flanks, and upon Mr. Thomson's map are shown as united into one river further south. The Lumi falls into Lake

Jipé, a small elongated lake south of Taveta, and this lake is shown as having an outlet into the system of streams which flows from the mountain slopes to the westward. On the eastern side of Kilimanjaro the sources of the Tzavo gush forth at the base, but on the northern side stretches the great plain of Ngiri, once, as is proved by the ponds and swamps yet remaining, the bottom of a lake. Ngiri is 3550 feet above the sea. Not a stream descends from the mountain on its northern side.

Lakes Naivaha and Baringo prove to be both of small size. The latter especially has shrunk, from the liberal dimensions accorded it upon the best maps published before Mr. Thomson's journey, into an island-dotted sheet about a quarter of a degree in length. Both lakes occupy portions of a longitudinal trough, akin to that in which the Dead and Red seas are lodged, and running north and south for an immense distance; flanked to the east by the Kaptè plateau, and westward by the escarpment of Mau. This depression was reached by Mr. Thomson from the south, after passing through Ngiri and through the Matumbato, a sterile but somewhat watered and inhabited broken country with red soil. South of Naivasha the trough is occupied by a desert, and the caravan ascended the Kaptè plateau for food and water, resting awhile at Ngongo-a-Bagas (6150 feet) near the source of the river Alhi, which waters the country of Ukambani farther to the east. A little to the south of Lake Naivasha is the remarkable conical extinct volcano Donyo (mountain) Longonot. This rises 3000 feet above the plateau or 9000 above the sea, and the edge of the crater, which is about two miles across, is so sharp that a man can sit astride of it. Lake Naivasha is a comparatively shallow fresh-water lake, about twelve miles long by nine wide, formed by the piling up of volcanic débris across the trough in which it stands. Cones and craters, the steaming mountain of Buru, faults producing angular outlines, and hot springs, attest recent volcanic activity. Further north, at Lake Baringo, the eastern side of the meridional depression is formed by the Lykipia mountains, which rise nearly 8000 feet abruptly above the lake. Opposite tower the Elgeyo precipices to a height of 7750 feet, a northern continuation of the Mau escarpment. The depression is here longitudinally divided by the Kamasia mountains. Lake Baringo lies west of these, while in the narrow valley between them and Elgeyo the Mbage or Weimei river runs toward the north through the Galla country to the salt lake Samburu.

Near Lake Naivasha Mr. Thomson, with a party of thirty men, left the main caravan, ascended the plateau to the east, here called Lykipia, and made his way to the foot of Mt. Kenia, hitherto unvisited by any European. The rivers of this region flow into the as yet unexplored Guaso Nyiro. On the way to Kenia a range of mountains, running north and south, and rising to nearly 14,000 feet was crossed. These were named the Aberdane moun-

tains. Kenia, like Kilimanjaro, is a volcanic cone. The base is nearly thirty miles across, and its sides slope upwards at a low angle, almost unbroken by ridge or glen, to a height of 15,000 feet. Above this rises a sugar-loaf peak, with glittering facets of snow on its upper 3000 feet, yet with sides so steep that the snow will not lie in many places. At this point the enmity of the Masai, coupled with the atrocious nature of the food, which as all the cattle were dying of some plague, consisted liberally of rotten meat, compelled a retreat in the direction of Lake Baringe.

Westward from the Elyeyo precipices extends the vast treeless plain of Guas-Ngishu, bounded northward by the great volcanic mountain of Masawa or Elgon—a counter part of Kenia without the upper peak. Farther northward lies the occasionally snow clad mountain Donyo Lekakisera. The country of Kavirondo lies to the west of the shelterless plateau, and surrounds the north-east part of Victoria Nyanza. It extends to within forty miles of the Nile, and does not reach more than thirty miles south of the equator. A considerable part of this tract lies where Victoria Nyanza is shown upon our maps. The Wa-Kavirondo are a pleasant people, dangerous only when excited or drunk, and though the similarity of houses, manners, mode of life, etc., suggest unity of race, are really, as their language indicates, formed of a mixture of Wa-swahili with Nile tribes, the latter predominating southward. Kwa-sundu is a large town, and food can here be obtained in marvelous abundance and cheapness. The Wa-kavirondo wear no clothes, unless a small bunch of cord, worn tail-fashion by the married women only, can be styled an article of clothing.

Mr. O'Neill's Explorations.—The journey recently undertaken by Mr. H. E. O'Neill to Lakes Shirwa and Amaramba has solved the problem of the sources of the Lujenda. That river does not rise in Lake Kilwa or Shirwa but flows from Lake Amaramba, which is connected by the river Msambiti with Lake Chireta. These small lakes lie north of Kilwa, which has not been known to connect with their drainage within the memory of man, although the slight difference in level between the Mikoko river (which flows into Lake Kilwa) and the Mtoradenga swamp is so light that such a connection may probably follow unusually heavy rains. Mr. O'Neill believes that the Rev. Mr. Johnson's statement that Lake Kilwa has its outlet in the Lujenda is due to a mistake, and that the spot visited by Mr. Johnson was really the northern end of Lake Amaramba. The description of the scenery given by Mr. Johnson tallies with that at Amaramba, and the natives, who told Mr. O'Neill that he was the first white man who had visited Kilwa, remembered the visit of an European to Amaramba. The water of Lake Kilwa is brackish, that of the more northern lakes sweet and drinkable.

On his return to the coast Mr. O'Neill took a more southerly

course, with the object to discover some practicable channel of communication with the natives of the large area of country lying between Lake Nyassa and the coast. A large portion of this country, marked upon the maps as Makua land, is really occupied by the Lomwe. The valley of the Likuga is very thickly peopled, as is indeed the entire country except near the coast where the long continued slave trade has caused depopulation. Mr. O'Neill believes the revered Namuli peak to be an extinct volcano, the upper cone of which has disappeared. The Lomwe of the Likuga are a strong tribe and have a bad character among the slave-dealing traders who are not allowed to pass through their country. Their houses are oblong, strong, and with doors and veranda high enough to be entered without stooping. The only rivers that extend a considerable distance inland between the Zambezi and Lujenda are the Miuli, Ligonya, Mlela and Likugu, but none of these furnish a waterway into the interior, which can, in Mr. O'Neill's opinion, be reached most conveniently from Lake Nyassa and the Shiré.

In a subsequent journey Mr. O'Neill has traced the course of the Ruo river, which has been brought forward as the natural and proper boundary of the Portuguese in this direction.

GEOLOGY AND PALÆONTOLOGY.

THE POSITION OF PTERICHTHYS IN THE SYSTEM.—It is probable that the most primitive type of vertebrate of which we have any knowledge in a fossil state is the genus *Pterichthys*, if vertebrate it can be called. No intelligent attempt has as yet been made to assign this animal to its exact position. The opportunity of examining specimens of the *P. canadensis* Whiteaves, having been afforded me by Dr. A. R. C. Selwyn, director of the Geological Survey of Canada, I give here the results of my examination. Numerous specimens in which the anterior portion of the animal is well preserved, display three important peculiarities. There is a single opening on the middle line above. There are no orbits. There is no lower jaw.¹ The single opening may well be compared with the so-called nasal pouch of the lampreys. The absence of orbits is comparable to the condition in *Amphioxus*. In the absence of a lower jaw it agrees with both the types mentioned.

I have also instituted comparisons with the Tunicate genus *Chelyosoma*, of which the Smithsonian Institution, through the recommendation of Dr. Dall, has liberally placed at my disposal a fine alcoholic specimen from Point Barrow, Alaska. The scutellation of the dorsum of this animal agrees in every detail with that of *Pterichthys*, excepting in some of the small segments

¹ A pair of small, delicate lamini-form bones found beneath the anterior end of the carapace are of uncertain determination.